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NATIONAL DAM SAFETY PROGRAM. WHITEHEAD DAM (NJ00559), DELAWARE --ETC(U)
MAR 80 R WRUBEL DACW61-79-C-0011

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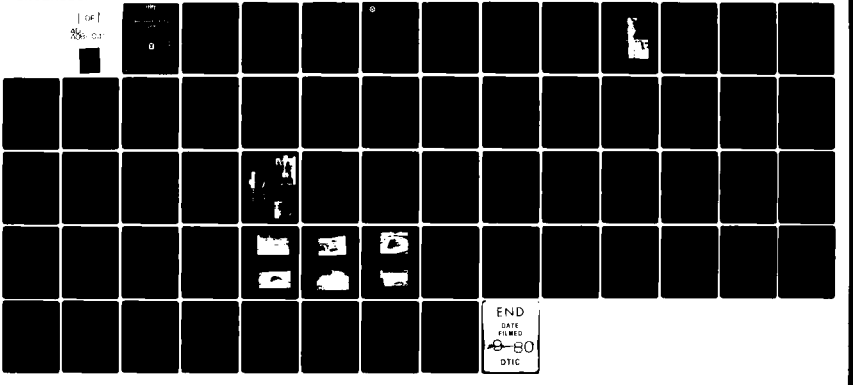

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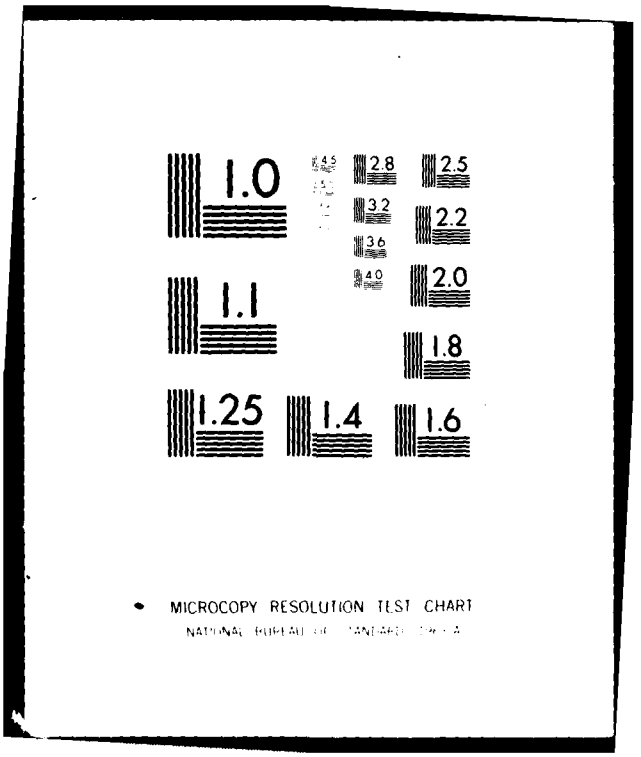
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DELAWARE RIVER BASIN
ASSUNPINK CREEK, MERCER COUNTY
NEW JERSEY

WHITEHEAD POND DAM

NJ 00559

PHASE 1 INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

DEPARTMENT OF THE ARMY

Philadelphia District
Corps of Engineers
Philadelphia, Pennsylvania

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MARCH 1980

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

Copies are obtainable from National Technical Information Service, Springfield, Virginia 22151.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Dams	National Dam Safety Program
Embankments	Whitehead Pond Dam, New Jersey
Structural Analysis	Riprap
Visual Inspection	Spillways

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report cites results of a technical investigation as to the dam's adequacy. The inspection and evaluation of the dam is as prescribed by the National Dam Inspection Act, Public Law 92-367. The technical investigation includes visual inspection, review of available design and construction records, and preliminary structural and hydraulic and hydrologic calculations, as applicable. An assessment of the dam's general condition is included in the report.

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
CUSTOM HOUSE—2 D & CHESTNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

IN REPLY REFER TO
NAPEN-N

Honorable Brendan T. Byrne
Governor of New Jersey
Trenton, New Jersey 08621

11 AUG 1980

Dear Governor Byrne:

Inclosed is the Phase I Inspection Report for Whitehead Pond Dam, in Mercer County, New Jersey which has been prepared under authorization of the Dam Inspection Act, Public Law 92-367. A brief assessment of the dam's condition is given in the front of the report.

Based on visual inspection, available records, calculations and past operational performance, Whitehead Pond Dam, initially listed as a high hazard potential structure, but reduced to a significant hazard potential structure as a result of this inspection, is judged to be in poor overall condition. The dam's spillway is considered inadequate because a flow equivalent to 31 percent of the One Hundred Year Flood would cause the dam to be overtopped. However, more detailed hydraulic and hydrologic studies are not recommended due to the high level of tailwater caused by downstream restrictions to flow. At such time as these flow restrictions are removed, studies to ensure the spillway's adequacy should be initiated. To ensure adequacy of the structure, the following actions as a minimum, are recommended:

a. Engineering studies and analyses should be initiated within one year from the date of approval of this report to investigate the stability of the dam and develop remedial measures for repair of the dam.

b. The scoured areas behind the abutments and the downstream connecting walls to the bridge should be regraded and protected with slope paving or grouted stone riprap within one year from the date of approval of this report.

c. The owner should develop an emergency action plan and downstream warning system within six months from the date of approval of this report.

d. The owner should develop written operating procedures and a periodic maintenance plan to ensure the safety of the dam within one year from the date of approval of this report.

NAPEN-N
Honorable Brendan T. Byrne

A copy of the report is being furnished to Mr. Dirk C. Hofman, New Jersey Department of Environmental Protection, the designated State Office contact for this program. Within five days of the date of this letter, a copy will also be sent to Congressman Thompson of the Fourth District. Under the provision of the Freedom of Information Act, the inspection report will be subject to release by this office, upon request, five days after the date of this letter.

Additional copies of this report may be obtained from the National Technical Information Services (NTIS), Springfield, Virginia 22161 at a reasonable cost. Please allow four to six weeks from the date of this letter for NTIS to have copies of the report available.

An important aspect of the Dam Inspection Program will be the implementation of the recommendations made as a result of the inspection. We accordingly request that we be advised of proposed actions taken by the State to implement our recommendations.

Sincerely,

1 Incl
As stated

JAMES G. TON
Colonel, Corps of Engineers
District Engineer

Copies furnished:
Mr. Dirk C. Hofman, P.E., Deputy Director
Division of Water Resources
N.J. Dept. of Environmental Protection
P.O. Box CN029
Trenton, NJ 08625

Mr. John O'Dowd, Acting Chief
Bureau of Flood Plain Regulation
Division of Water Resources
N.J. Dept. of Environmental Protection
P.O. Box CN029
Trenton, NJ 08625

WHITEHEAD POND DAM (NJ00559)

CORPS OF ENGINEERS ASSESSMENT OF GENERAL CONDITIONS

This dam was inspected on 16 November 1979 by Louis Berger and Associates, Inc.. under contract to the State of New Jersey. The State, under agreement with the U.S. Army Engineer District, Philadelphia, had this inspection performed in accordance with the National Dam Inspection Act, Public Law 92-367.

Whitehead Pond Dam, initially listed as a high hazard potential structure, but reduced to a significant hazard potential structure as a result of this inspection, is judged to be in poor overall condition. The dam's spillway is considered inadequate because a flow equivalent to 31 percent of the One Hundred Year Flood would cause the dam to be overtopped. However, more detailed hydraulic and hydrologic studies are not recommended due to the high level of tailwater caused by downstream restrictions to flow. At such time as these flow restrictions are removed, studies to ensure the spillway's adequacy should be initiated. To ensure adequacy of the structure, the following actions as a minimum, are recommended:

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d. The owner should develop written operating procedures and a periodic maintenance plan to ensure the safety of the dam within one year from the date of approval of this report.

(15) DA-NAE-11-C-80A12 (9) Final rpt. (11) May 80

(12) Rudolph/Wrobel

APPROVED: James G. Ton (12) 62

JAMES G. TON
Colonel, Corps of Engineers
District Engineer

DATE: 8 Aug 80

(1) National Dam Safety Program. Whitehead Dam (NJ00559), Delaware River Basin, Tributary Crosswicks, Mercer County, New Jersey. Phase I Inspection Report.

421892

PHASE I REPORT
NATIONAL DAM INSPECTION PROGRAM

Name of Dam: Whitehead Pond Dam Fed ID# 00559
New Jersey ID# 28-18

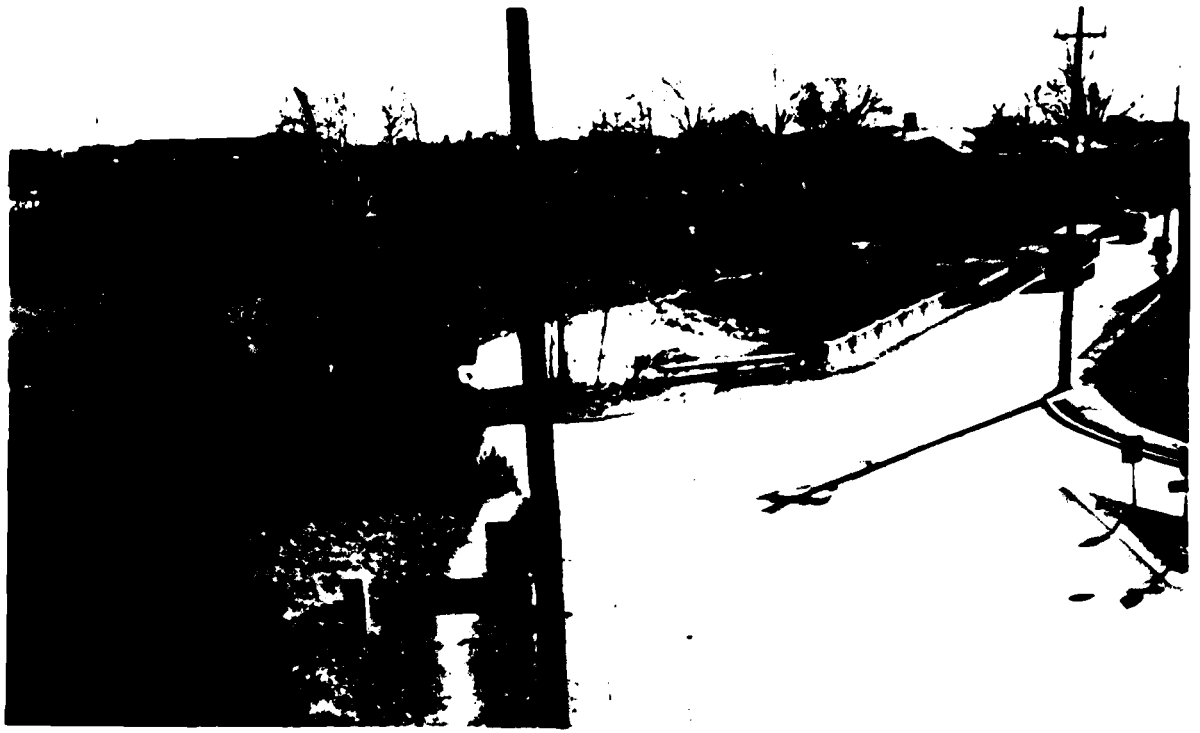
County Located Mercer County
Coordinates Lat. 4014.9 - Long. 7443.6
Stream Assunpink Creek
Date of Inspection 16 November 1979

ASSESSMENT OF GENERAL CONDITIONS

Whitehead Pond Dam is assessed to be in a poor overall condition but it is recommended to be downgraded to a significant hazard classification. A collapse of the dam would have little effect on the downstream disaster conditions due to the high level of tailwater caused by run-of-the-river flooding conditions that the dam attributes little to. Recommended remedial measures only include regrading selected portions of the retained slopes and the continued monitoring of the spillway. It is recommended, however, that further engineering studies be undertaken in the future to ascertain the continued stability and to evaluate the effects of removal of the dam or alternate solutions.

The dam has an inadequate spillway, being able to discharge only 30% of the 100-year design flood. Further hydraulic studies under the purview of P.L. 92-367, however, are believed unnecessary in view of the on-going flood plain hazard analyses of the U.S. Soil Conservation Service.

Rudolph Wrubel
Vice President
Louis Berger & Associates, Inc.



OVERVIEW OF WHITEHEAD POND DAM

November 1979

TABLE OF CONTENTS

FIGURES

APPENDIX

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. The test flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM
NAME OF DAM: WHITEHEAD POND DAM FED I.D. #NJ 00559

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

a. Authority

This report is authorized by the Dam Inspection Act, Public Law 92-367, and has been prepared in accordance with Contract FPM-36 between Louis Berger & Associates, Inc. and the State of New Jersey and its Department of Environmental Protection, Division of Water Resources. The State, in turn, is under agreement with the U.S. Army Corps of Engineers, Philadelphia to have this inspection performed.

b. Purpose of Inspection

The purpose of this inspection is to evaluate the structural and hydraulic condition of the Whitehead Pond Dam and appurtenant structures, and to determine if the dam constitutes a hazard to human life or property.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam and Appurtenances

Whitehead Pond Dam is a 150 year old earthen run of the river dam with a 115 foot long spillway beginning 70 feet from the south abutment. The spillway consists of mortared stone with numerous concrete and miscellaneous riprap patches. The south abutment embankment contains a concrete retaining wall along the pond side but has no backslope as the ground elevation remains level west to Whitehead Road. The north end of the spillway terminates approximately 40 feet from the centerline of a treatment plant access road. The height of the dam is approximately seven feet at the spillway.

b. Location

Whitehead Pond Dam is located approximately 75 feet east of Whitehead Road, approximately 0.4

mile south of the U.S. Route 1 and Whitehead Road, and 0.6 miles east of the intersection of U.S. Route 1 and State Highway 206, in Lawrence & Hamilton Townships, Mercer County, New Jersey. It impounds the main channel of Assunpink Creek. The township boundary runs down the center of the stream.

c. Size Classification

The maximum height of the dam is approximately 9 feet and the maximum storage is estimated to be 204 acre-feet. Therefore the dam is placed in the small size category as defined by the Recommended Guidelines for Safety Inspection of Dams (storage less than 1,000 acre-feet and height less than 40 feet).

d. Hazard Classification

The dam is extremely low and impounds a reservoir which is heavily silted up. Although there is a considerable history of damaging floods in this reach of the Assunpink Creek, overtopping or collapse of the structure as it now stands would have little effect on the downstream property conditions or further endanger human life. A failure of the study dam would, in all probability, do little or no damage to the County bridge on Whitehead Road (albeit the long term effect would plug up the waterway opening). However, in view of the utilities within this county bridge, the proximity of the Goodall Rubber plant and the urban terrain, the hazard classification is recommended to be downgraded to significant, although this has no reflection on the continued flooding conditions along Assunpick Creek. The dam actually contributes little to this existing condition.

e. Ownership

The dam and surrounding property is owned by the Goodall Rubber Company, Whitehead Road, P.O. Box 8237, Trenton, New Jersey, 08650.

f. Purpose of Dam

The dam was originally constructed to supply power for the mill located just downstream of the County Bridge. Presently, the pond created by the dam is used for storage of process cooling water for the Goodall Rubber Company which maintains an intake near the left abutment.

g. Design and Construction History

The original construction at this site is said to have been completed approximately 150 years ago by the Whitehead Rubber Company, the original owner. No recorded information was located but the State Department of Environmental Protection made an inquiry to the Goodall Rubber Company in 1971 as to the legal ownership. There are no records of the early construction or repairs except it appears there was a raceway near the left abutment which extended into the Goodall building south of Whitehead Road. From 1979 correspondence between the State and Goodall executives it was noted that the Goodall Rubber Company had experienced "ten to twelve floods of varying intensities, some very serious, since 1970; resulting in losses well over a million dollars." (See appended letter dated February 20, 1979). On January 29, 1979 after heavy rains a leak was observed in the spillway face. Repairs were completed on February 3, 1979 and consisted of placing large stone and gravel, dredged from the downstream channel, in the cavity. Rock was also piled above the spillway crest to allow for settlement and erosion. The State disputed this practice and ordered the removal of the stone as it allegedly diminished the spillway capacity. After considerable discussion, the disagreement was apparently resolved.

1.3 PERTINENT DATA

a. Drainage Area

This Assunpink site has a drainage area of 76.8 square miles which consists of woodland, cropland, meadowland, and rural residential development. The area includes four upstream dams on the main branch of the river.

b. Principal spillway capacity at maximum pool elevation (top of dam) - 1,300 cfs

c. Elevation (ft. above MSL)

Top of dam - 45.9
Recreation pool - 43.4 (spillway crest)
Streambed at centerline of dam - 35± (varies)

d. Reservoir

Length of maximum pool - 11,000 feet
Length of recreation pool - 6,000 feet

e. Storage (acre-feet)

Recreation pool - 88
Top of dam - 204

f. Reservoir Surface (acres)

Top dam - 70.5
Recreation pool - 22

g. Dam

Type - Earth with concrete and stone masonry spillway
Length - 225 feet
Height - 9 feet
Top Width - 3 feet (at spillway)
Side Slopes - 3H:1V (very approximate)
Zoning - Unknown
Cutoff - Unknown
Grout curtain - None

h. Diversion and Regulating Tunnel

None

i. Spillway

Type - Narrow crested weir with sloped splash apron
Length - 115'
Crest elevation - 43.4
Gates - None
U/S Channel - Main reservoir
D/S Channel - Natural channel

j. Regulating Outlets - None

SECTION 2 - ENGINEERING DATA

2.1 DESIGN

No plans or computations were located for the dam structure and its original configuration can only be surmised from field measurements. The Soil Conservation Service furnished a 1976 report on the Flood Hazard Analyses for the Assunpink Watershed but this contains no structural engineering data except for surveyed elevation control.

This dam is located in the southwest part of Mercer County near the westerly limit of the inner zone of the Coastal Plain physiographic province. Recent alluvial deposits consisting mainly of silt and sand with some clay comprise the surficial soils and a significant amount of organic material is generally mixed with the recent alluvium near the ground surface. Stratified alluvial sands, silty sand and sandy silts of the Cape May and Pennsauken formation occur at the ground surface in the vicinity of the dam. Further, stratified glacial drift composed predominately of sand and silt with gravel and cobbles is also present at the ground surface in proximity to the dam. Both soil groups have good internal drainage characteristics.

The Cape May-Pennsauken soils and the glacial soils are underlaid, at depths generally greater than ten feet, by the Magothy and Raritan Formations. These marine formations are comprised of alternating beds of clay and sand. Assunpink Creek is near the westerly extent of the Magothy and Raritan formations and their overall thickness may be as little as twenty five feet. Precambrian bedrock underlies these formations and comes to within ten feet of the ground surface. However, west of Assunpink Creek, the Precambrian bedrock dips abruptly and the Stockton Sandstones are found at depths of less than ten feet in many areas.

2.2 CONSTRUCTION

Nothing is known about the original construction except the structure is approximately 150 years old. Certain portions of the concrete caps on the random stone masonry walls appear to have been installed within the last 50 or 60 years.

2.3 OPERATION

Presently, the principal purpose of the dam is to provide storage impoundment for process cooling water for the owner. The dam is uncontrolled as there are no operational facilities except for the factory intake controls. Hydraulically, the dam appears to operate satisfactorily for low flows.

2.4 EVALUATION

a. Availability

Sufficient engineering data is available to assess the structural stability and hydrologic characteristics of this dam. The foundation stability is not questioned although no borings or founding levels of the various wall components were located.

b. Adequacy

The field inspection and review of available data reveal that the dam is structurally acceptable in its present condition. It is felt that adequate data was available to render the following assessment contained in Sections 6 and 7 without recourse to gathering additional information.

c. Validity

The validity of the available data is not challenged and is accepted without recourse to futher investigations.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

a. General

The on-site inspections were conducted on November 16, 1979 and revealed the dam to be in an overall stable condition. Following a period of heavy rain, the site was revisited on January 29, 1980. As can be seen from the 1975 attached photographs (Figure 4), the entire flood plain can be heavily inundated and the spillway submerged. It was noted that the downstream flow was restricted to some degree by the County bridge at Whitehead Road. As discussed elsewhere, the flood plain in this reach of the river is subject to heavy, damaging floods.

b. Dam

The straight walled spillway structure is in poor alignment and the overflow flows freely but irregularly over various spots. The exposed concrete surfaces at the surrounding retaining walls exhibits numerous spalled and chipped areas with some efflorescence noted. The recent repair work appears to be in good condition with only minor irregularities. Severe cracks and tilting were observed at the right wingwall and portions of the top have broken off. The embankment sections behind the walls are in good condition but some surface erosion was observed behind the left downstream wingwall.

The limits of the manmade embankment can no longer be discerned as most of the downstream slopes have been backfilled up to the level of Whitehead Road. At the bridge, the average dam crest is about two feet above the street grade.

Riprap has been placed in the vicinity of the spillway near the right abutment and asphalt dumped in other sections to arrest erosion.

c. Appurtenant Structures

Except for the process water intake near the left abutment, there are no appurtenant structures. The spillway wall and masonry downstream slope comprise a large part of the true dam in the

present configuration. The junctures of the irregular spillway and the wingwalls at the left end are in need of repair and numerous chinks of concrete and/or stone masonry are missing or dislodged. The flat ogee splash apron is cracked and broken in some areas and has repeatedly been patched and cavities have been filled with loose stone.

d. Reservoir Area

Whitehead Mill Pond is heavily silted up and large areas are overgrown with marshland grass and weeds. The low water banks are irregular but well stabilized. Along the west bank, Elsa Drive extends up to the Ewing/Lawrence Sewer Authority treatment plant, of which most is above high water. Further upstream, the floodway limits extend over to the Trenton and Raritan Canal on the west and well beyond Sweet Briar Avenue on the east. At the time of inspection, the mill pond was fairly clear of debris but there is evidence along the water course that considerable debris collects along the shoreline. The confluence of both Miry Run and Shabakunk Creek with the Assunpink is roughly 2000 feet above the dam.

e. Downstream Channel

Immediately below the spillway, Assunpink Creek discharges through County bridge #6-540.2 which severely restricts the hydraulic flow (see Section 5). This bridge was built in 1908 and although rehabilitated in 1938, is situated too low and is too narrow to accommdate the seasonal floods of this large watershed. As observed on the appended photographs, this section is easily completely inundated by restrictions further downstream.

SECTION 4 - OPERATIONAL PROCEDURES

4.1 PROCEDURES

Operational procedures were not observed during the inspection. Based upon discussions with engineering management of Goodall, the only procedures currently in effect are the monitoring of the intake for their processing water.

4.2 MAINTENANCE OF DAM

The dam is maintained by Goodall personnel on an as-needed basis. Inspections are conducted after major storms and seasonally by maintenance crews responsible for the general upkeep. The only maintenance undertaken recently was the repair of the spillway slope wall following the 1979 storm of January 21st.

4.3 MAINTENANCE OF OPERATING FACILITIES

As there are no operating facilities within the dam insofar as discharge capacity is concerned, there are no maintenance aspects to report upon.

4.4 DESCRIPTION OF WARNING SYSTEM

No warning system exists at this specific site except for monitoring by plant personnel and municipal police during major storms.

4.5 EVALUATION

The existing operational and maintenance procedures and safeguards during major storms are considered adequate for the following reasons:

- The dam has been overtopped numerous times in the past but, since it is a relatively low structure has suffered only minor damage.

- The river channel experiences high backwater from downstream constrictions which essentially diminishes the function of the dam to one of a submerged weir during periods of extremely heavy flows. (See Section 5). The dam is essentially a "run-of-the-river" minor constriction during floods.

- The primary purpose of the lake and dam preclude any additional operational procedures other than

those now in practice. Further, several additional studies are currently being undertaken to improve the flood control characteristics of this lower reach of Assunpink Creek.

SECTION 5 - HYDRAULIC/HYDROLOGIC

5.1 EVALUATION OF FEATURES

a. Design Data

Based upon the Recommended Guidelines for Safety Inspection of Dams, Whitehead Pond Dam is of small size and is placed in the significant hazard category. A 100-year frequency event was selected as the design storm by the inspecting engineers. Flow at the dam was calculated using Special Report 38, "Magnitude and Frequency of Floods in New Jersey With Effects of Urbanization" by New Jersey Department of Environmental Protection in cooperation with United States Department of The Interior Geological Survey. This yielded a peak flow of 4600 cfs. At the downstream Trenton gage station on Assunpink Creek, with a drainage area of 86.9 square miles, frequency analysis by the U.S. Geological Survey produced a 100-year frequency discharge of 4330 cfs. Flood routing was not performed since Whitehead Pond Dam is a "run of the river" dam with essentially the entire length of the 225-foot dam functioning as a spillway; therefore only minor peak flow attenuation can be expected. Further, the Whitehead Road Bridge (only 75 feet downstream), controls the flow at high discharges and submerges the weir flow of the dam. The bridge roadway floods during heavy storms.

b. Experience Data

In 1975 the most recent severe storm of record occurred at Whitehead Pond, and inundated the downstream roadway area and the surrounding buildings, and easily submerged the weir flow. An unofficial stage gage, placed by the owner of the dam on the downstream side of Whitehead Road Bridge, recorded elevations in excess of 11 feet, bringing the water surface elevation to above 46.5 MSL, thus inundating the bridge and the surrounding area. The USGS gage station at the downstream Trenton gage recorded peak flows of 5,450 cfs on July 21, 1975, which is approximately a 1 in 300 year frequency storm, since a 1 in 500 year storm is estimated by the USGS to be 5,660 cfs. Hence, using the calculated spillway capacity of 1,300 cfs, the dam can only accommodate 24% of the flood of record.

c. Visual Observations

It was noted by the inspection team that Whitehead Pond has considerable silt buildup and vegetative growth in a large portion of its surface area, thus diminishing the below spillway crest storage capacity. It was also observed that the downstream bridge is at an elevation only slightly higher than the dam. Elevations obtained from the Soil Conservation Service indicated the bridge deck to be about 1 foot higher than the spillway crest. It is obvious that any flooding which resulted in the dam weir submergence would innundate the bridge deck and other portions of the surrounding terrain.

d. Overtopping Potential

As mentioned previously, Whitehead Pond dam has a history of repreated overtopping. Moreover, the hydraulic analyses substantiates that the spillway is inadequate to accomodate the design flood. Therefore, the potential for overtopping remains considerable. Overtopping however, would have little effect on the dam itself and the downstream flooding problem appears to be little influenced by the hydraulic condition at the dam.

e. Drawdown Potential

There is no drawdown facility at the dam. The only possibility of drawdown might be accomplished through the intake pipes leading to the Goodall Rubber Company which utilizes the water in its process manufacturing. However, the feasibility of utilizing this as a drawdown device is beyond the scope of this report.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observation

Based upon the field inspection and discussions with Goodall Industries engineering personnel, the structural stability of the dam is of little concern, although further deterioration of the spillway splash apron can be expected in the future. The spillway is cracked and broken at several places especially at the left end where it has been undermined. The low, one foot thick, concrete topped rubble masonry wall that abuts the left end of the spillway and the downstream return wall which extends from the left end of the spillway to the roadway bridge abutment, are effectively retaining the natural ground lying between the lake and the downstream bridge. The remaining crest wall (facing the lake) is cracked and tilted toward the lake at several locations. Where it abuts the spillway, the wall has settled and is also cracked. Concrete was dumped at this location to prevent further erosion by water flowing around the deteriorated spillway. The wall extending from this point to the downstream bridge has several small cracks, but overall appears in good condition. The backfilled zone behind this wall is approximately four feet higher than the top of wall but the area immediately behind the wall has been eroded, possibly from overtopping of the low wall facing the lake. Rip-rap has been placed in the vicinity of the right end of the spillway and macadam has been dumped over other sections of the slope to arrest erosion. This erosion can be partly attributed to water flowing between the spillway and the abutment zone. However, in spite of the irregularity of the crest elevation and deteriorated condition of the spillway crestwall, the structural stability is satisfactory in view of the fact that the dam has demonstrated the ability to withstand overtopping.

b. Design and Construction Data

Summarizing Section 2, little is actually known regarding the initial construction or any design assumptions. The dam appears to have been altered, modified and repaired numerous times

since its installation. Under the context of this report, additional design data would not basically alter any condition insofar as the downstream flooding conditions are concerned.

c. Operating Records

Written operating records are non-existent.

d. Post Construction Changes

There have been numerous modifications and repairs undertaken at this site, but no records exist save certain directives of the Division of Water Resources. It is unknown to what degree of compliance these were followed.

e. Seismic Stability

This dam is stable under earthquake acceleration loadings. It is located in Seismic Zone 1 and experience reveals that such low dams with indeterminate width to height ratios will have adequate stability under dynamic loading conditions if stable under static gravity conditions.

SECTION 7 - ASSESSMENTS/RECOMMENDATIONS/ REMEDIAL ACTIONS

7.1 DAM ASSESSMENT

a. Safety

Subject to the inherent limitations of the Phase I visual inspection, the Whitehead Millpond Dam is judged to be in a poor overall condition. The spillway has an insufficent capacity and can discharge only 30% of the design flood. Although this is inadequate, normal yearly flooding need only rise 2.5 feet to inundate the crest and surrounding streets and buildings. Failure of the dam induced by overtopping might cause some rubble to block up the inadequate hydraulic opening of the downstream bridge but little can be envisioned at this specific site to alleviate the serious flooding potential of this downstream reach of the Assunpink. As previously stated, flood tailwater produced by downstream conditions submerge the spillway crest, so its capacity is irrelevant.

b. Adequacy of Information

The data located is deemed adequate regarding the enclosed analysis regarding safe operation and stability, but further in-depth survey would be required if major repairs were to be contemplated.

c. Urgency

No urgency is attached to implementing any further studies in view of the dam hazard assessment. It is recommended that the remedial measures set forth below be taken under advisement in the future.

d. Necessity for Further Study

In view of the on-going flood plain hazard analyses of the U.S. Soil Conservation Service, further H&H studies under the purview of P.L. 92-367 are believed to be redundant and unnecessary. It should be noted that any attempt to redesign the spillway capacity of the dam be done in conjunction with a redesign of the Whitehead Road bridge.

7.2 RECOMMENDATIONS/REMEDIAL MEASUREMENTS

a. Recommendations

It is recommended that the scoured areas behind the abutments and downstream connecting walls (to the bridge) be regraded and protected with slope paving or grouted stone riprap.

Consideration should be given in the on-going studies referred to above relative to the ultimate removal of the dam and the reconstruction of the substandard Whitehead Road Bridge.

b. O&M Maintenance and Procedures

In the near future the owner should develop written operating procedures and a periodic maintenance plan to insure the safety of the dam. Additionally, further inspections should be properly recorded and the owner should liaise with other State and Municipal authorities so that a river-wide emergency action plan can be further developed to minimize downstream flooding hazards.

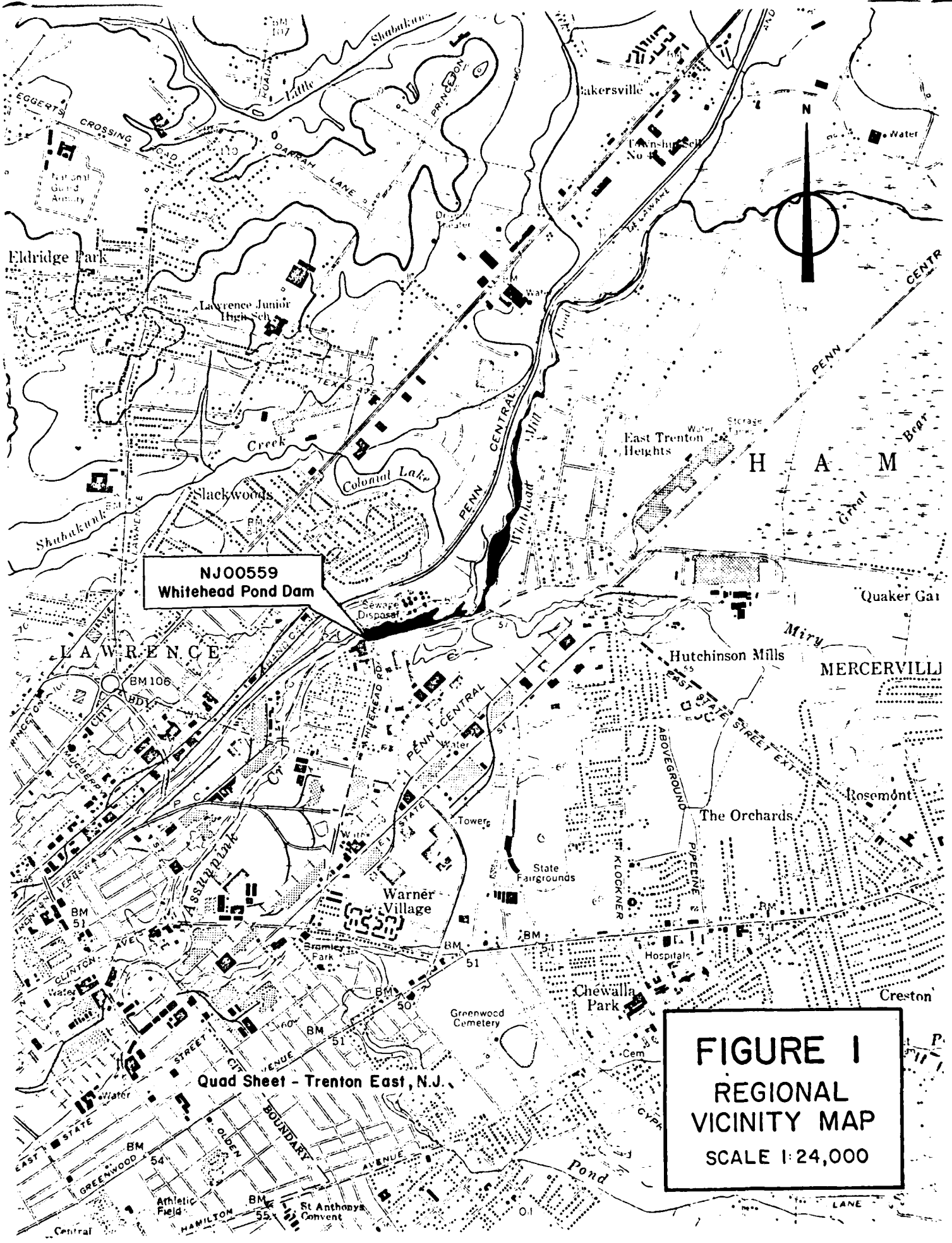
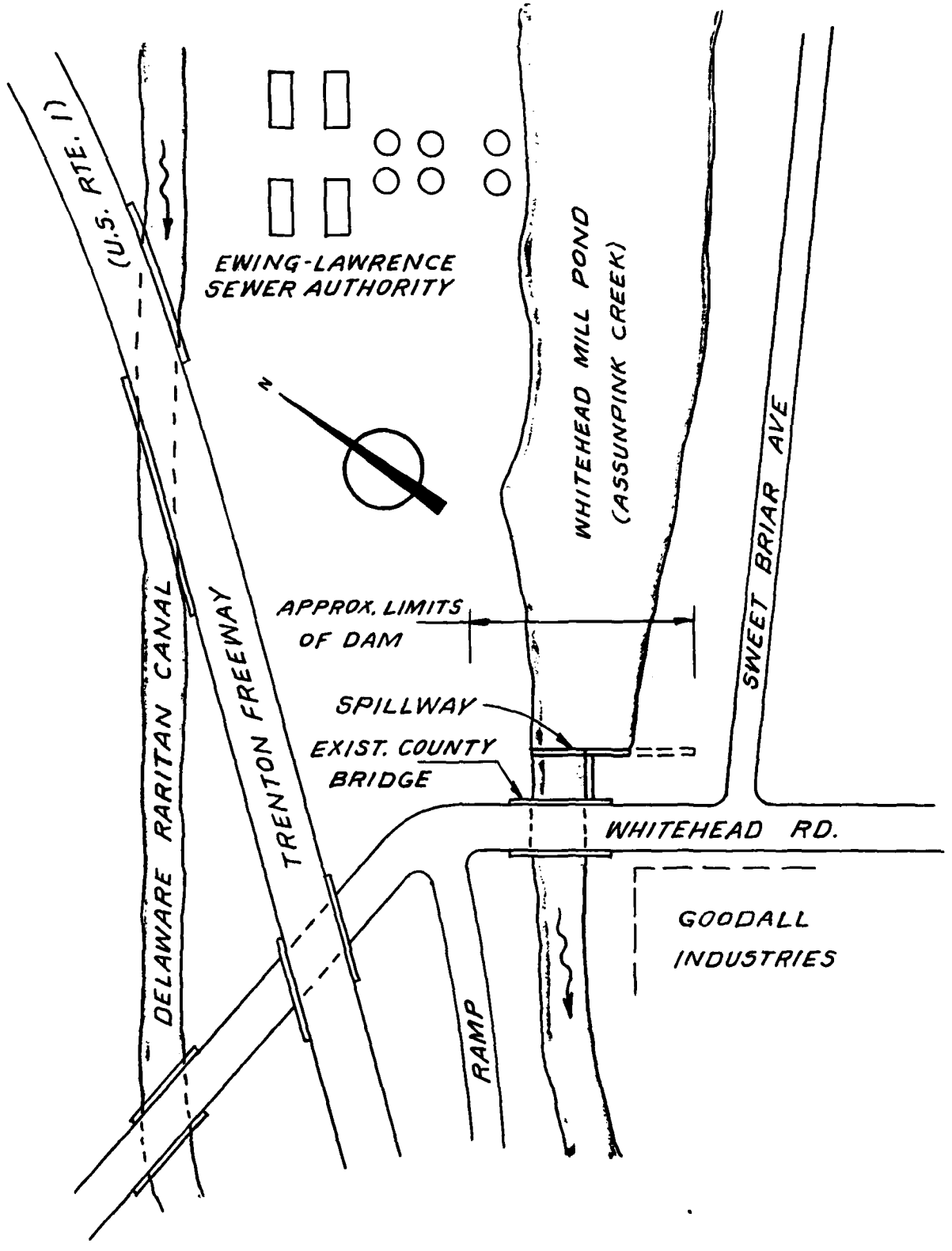
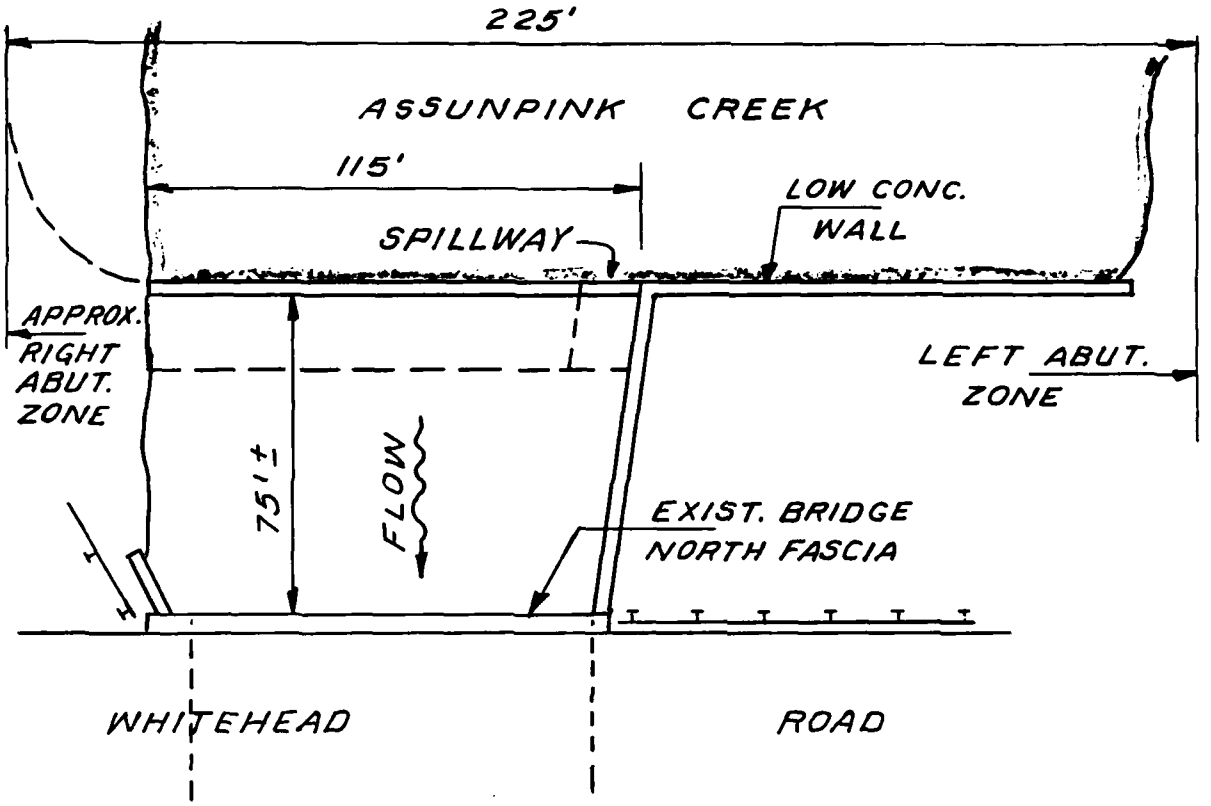


FIGURE 1
REGIONAL VICINITY MAP
SCALE 1:24,000

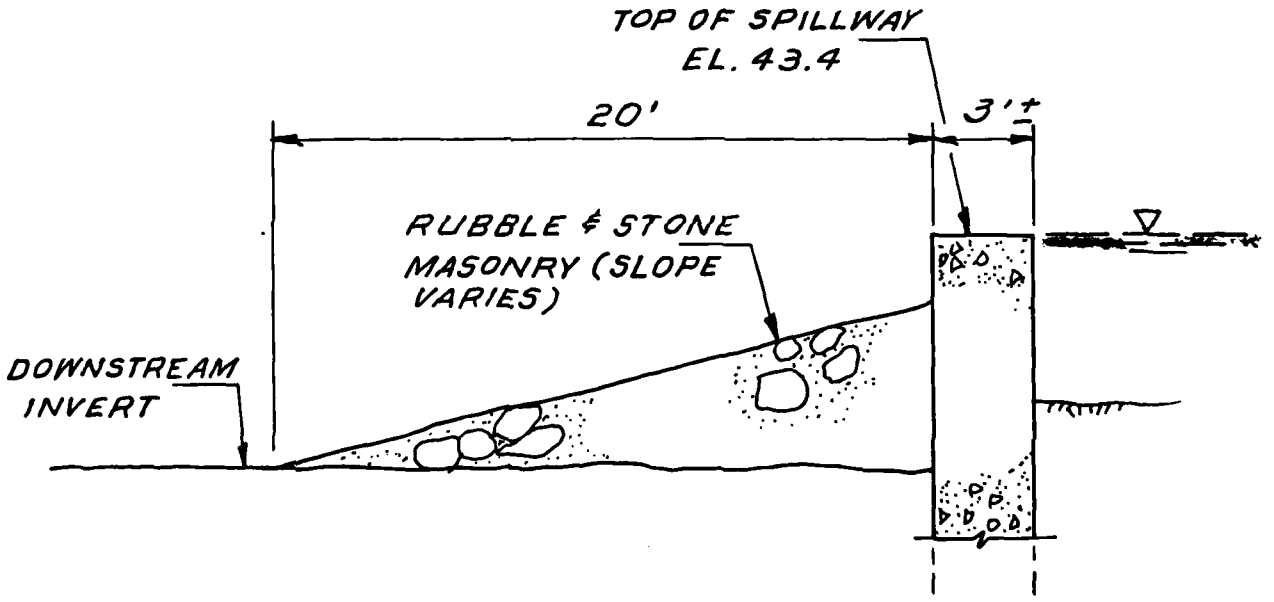


LOCATION PLAN
NOT TO SCALE

FIGURE 2



PLAN



SECTION THRU SPILLWAY
NOT TO SCALE

FIGURE 3

VIEWS OF 1975 FLOODING

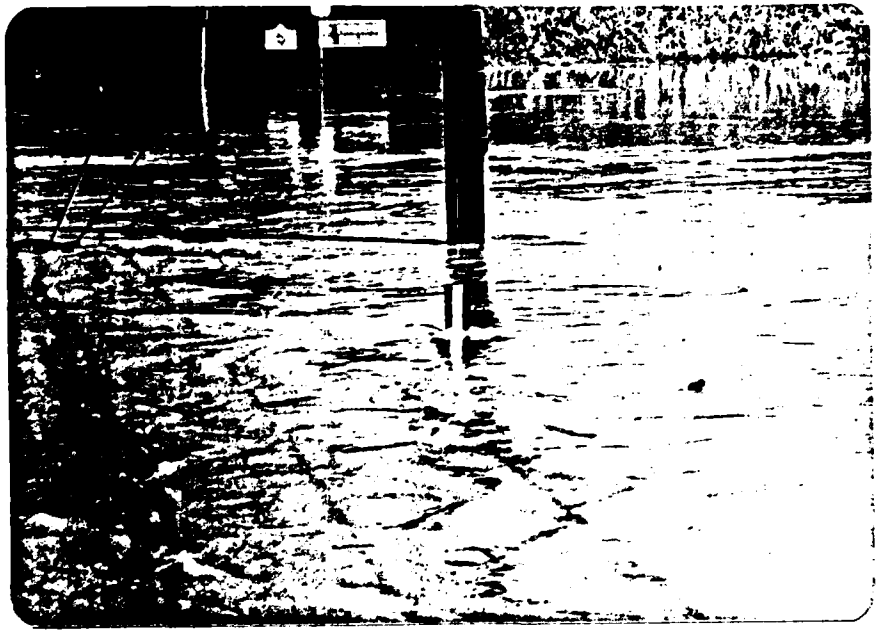


FIGURE 4

Check List
Visual Inspection
Phase 1

Name Dam Whitehead Mill Pond County Mercer State New Jersey Coordinators NJDEP

Date(s) Inspection 11-16-79 Weather Clear Temperature 40°F

Pool Elevation at Time of Inspection +43.5 M.S.L. Tailwater at Time of Inspection +37 M.S.L.

Inspection Personnel:

E. Simone J. Moyle J. Ceravolo

L. Baines D. Lang

J. Voorhees

D. Lang Recorder

CONCRETE/MASONRY DAMS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SEE PAGE ON LEAKAGE		
STRUCTURE TO ABUTMENT/EMBANKMENT JUNCTIONS	Poor, heavy cracking evident	
DRAINS	None	
WATER PASSAGES	None	
FOUNDATION	Unknown, no plans available, suspect timber cribs.	

CONCRETE/MASONRY DAMS

VISUAL EXAMINATION OF	OBERSVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS CONCRETE SURFACES	Many surface cracks particularly in abutments.	
STRUCTURAL CRACKING	Large structural cracking in spillway and abutments.	
VERTICAL AND HORIZONTAL ALIGNMENT	Poor, spillway has been knocked out of alignment from heavy flows, concrete slabs at east embankment in poor alignment.	
MONOLITH JOINTS	Unknown	
CONSTRUCTION JOINTS	Unknown	

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS		
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	No real toe exists, embankment at east end is flat and becomes roadway.	
SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES	Sloughing and erosion evident at east end near local street. Heavy erosion evident behind east retaining wall just below dam, due to embankment overtopping, beginning to expose backside of wall.	
VERTICAL AND HORIZONTAL ALINEMENT OF THE CREST	Crest elevation at east end approximately same elev. as street, about 2-2½ feet above spillway crest.	
RIPRAP FAILURES	Rip-rap failures at west abutment	

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	Poor, extensive concrete patchwork at east spillway abutment, rip rap and asphalt patching at west abut. also in poor condition.	
ANY NOTICEABLE SEEPAGE	No noticeable seepage.	
STAFF GAGE AND RECORDER	Staff gage located at southwest corner of bridge.	
DRAINS	None	

UNGATED SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR		
APPROACH CHANNEL	See Reservoir section.	
DISCHARGE CHANNEL	Dam Approx. 70-75' upstream of County Rd. & Bridge	
BRIDGE AND PIERS	Mercer County Bridge	

INSTRUMENTATION

VISUAL EXAMINATION	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
MONUMENTATION/SURVEYS	Benchmark M1-cut on pylon upstream right corner. El. 45.01 (adjusted).	See SCS Floodplain Study.
OBSERVATION WELLS	None	
WEIRS	None	
PIEZOMETERS	None	
OTHER	Staff gauge on SW corner of County bridge.	

RESERVOIR

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	Mild, local roads on either side.	
SEDIMENTATION	Heavy growth upstream, marshy estuary, heavy silting in reservoir up to spillway crest. Sewerage treatment plant 300 yds u/s West shore sits very low.	

DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	Mercer County Bridge 6-540.2 Built 1907, Improved 1938 County water line on u/s side approx. 36" dia. Soffit Height above stream bed = 7.6' wtr. elev. 1.8'	
SLOPES	Steep channelized 50-60' wide, highway retaining wall downstream on west side, asphalt and concrete dikes on east side. Outfall of sewage treatment plant at south west bridge abutment 2-pipes, constant discharge, said to be 12 mgd.	
APPROXIMATE NO. OF HOMES AND POPULATION	Numerous buildings of the Goodall Rubber Comp. Housing development below company. (Whitehead Manor)	

CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION

ITEM	REMARKS
PLAN OF DAM	Available - NJDEP - Div. of Water Resources - Bureau of Flood Plain Management
REGIONAL VICINITY MAP	Available - U.S.G.S. Quad
CONSTRUCTION HISTORY	Some available - Goodall Rubber Company
TYPICAL SECTIONS OF DAM	Available
HYDROLOGIC/HYDRAULIC DATA	Some available - (NJDEP)
OUTLETS - PLAN	Not available
- DETAILS	None available
-CONSTRAINTS	Unknown
-DISCHARGE RATINGS	None available
RAINFALL/RESERVOIR RECORDS	Some available - (NJDEP)

ITEM	REMARKS
SPILLWAY PLAN	Available (NJDEP)
SECTIONS	Available (NJDEP)
DETAILS	None available
OPERATING EQUIPMENT PLANS & DETAILS	Not applicable

ITEM	REMARKS
DESIGN REPORTS	None available
GEOLOGY REPORTS	None available
DESIGN COMPUTATIONS	Not available
HYDROLOGY & HYDRAULICS	Not available
DAM STABILITY	Not available
SEEPAGE STUDIES	Not available
MATERIALS INVESTIGATIONS	Not available
BORING RECORDS	Not available
LABORATORY	Not available
FIELD	Not available
POST-CONSTRUCTION SURVEYS OF DAM	Not available
BORROW SOURCES	Unknown

ITEM	REMARKS
MONITORING SYSTEMS	None
MODIFICATIONS	Some available - 1979 repair (NJDEP)
HIGH POOL RECORDS	Some available
POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS	None available
PRIOR ACCIDENTS OR FAILURE OF DAM	None available
DESCRIPTION	None available
REPORTS	None available
MAINTENANCE OPERATION RECORDS	None available

November, 1979

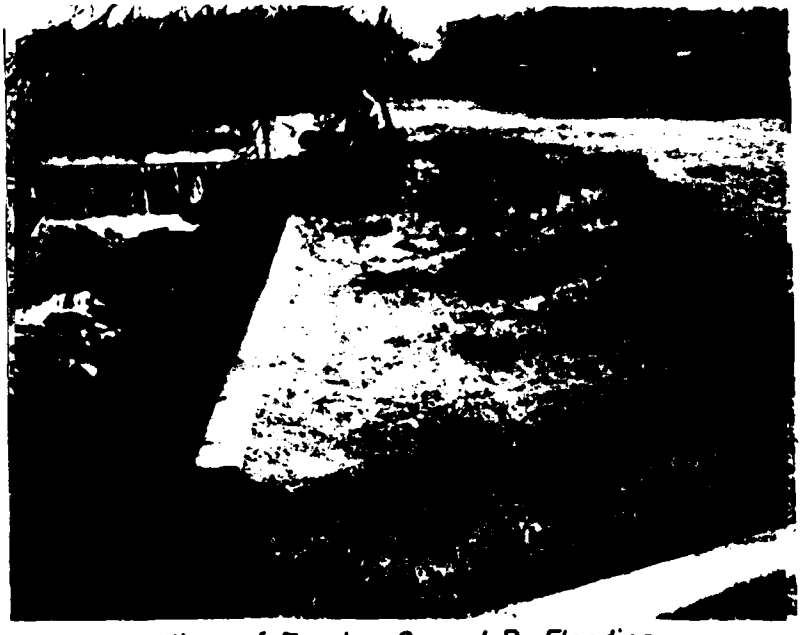
Upstream View of Dam

November, 1979

View of Spillway Looking North

November, 1979
View of Rubble Downstream of Spillway

November, 1979
View of Stone Masonry Wall That Abuts Left End of Spillway



View of Erosion Caused By Flooding
November, 1979

View of Bridge Immediately Downstream of Dam
November, 1979

CHECK LIST
HYDROLOGIC AND HYDRAULIC DATA
ENGINEERING DATA

DRAINAGE AREA CHARACTERISTICS: 76.8 square miles

ELEVATION TOP NORMAL POOL (STORAGE CAPACITY): +43.4 M.S.L. (88 acre-ft.)

ELEVATION TOP FLOOD CONTROL POOL (STORAGE CAPACITY):

ELEVATION MAXIMUM DESIGN POOL:

ELEVATION TOP DAM: +45.9 M.S.L. (204 acre-ft.)

CREST:

a. Elevation + 45.9 M.S.L.
b. Type Earth embankment
c. Width Varies 160'
d. Length 225 +
e. Location Spillover 90' + from south abutment
f. Number and Type of Gates None

OUTLET WORKS:

a. Type Concrete masonry
b. Location 90' + from south abutment
c. Entrance inverts +43.4 M.S.L.
d. Exit inverts +35.1 M.S.L.
e. Emergency draindown facilities None

HYDROMETEOROLOGICAL GAGES:

a. Type staff gauge
b. Location northwest bridge abutment
c. Records None available

MAXIMUM NON-DAMAGING DISCHARGE: 1300 cfs

BY L. CERVOLO DATE 1/14/80 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO 1 OF

CHKD. BY DATE WHITEHEAD POND DAM NJ00559 PROJECT C-246

SUBJECT

D.A. = 76.8 SQUARE MILES

TRIBUTARY - ASSUNPINK CREEK - DEL

HYDROGRAPH PARAMETERS

FROM C.O.E.

SNYDER COEFFICIENTS $C_t = 1.6$ $C_p = 0.5$

$$T_p = C_t (L L_c)^{0.3}$$

L = LENGTH OF LONGEST WATERCOURSE = 95,000' = 18 mi

L_c = LENGTH OF WATERCOURSE OPPOSITE CENTROID = 51,500' = 9.75 mi

$T_p = 1.6 (18 \times 9.75)^{0.3}$

$T_p = 7.59$ HRS = 7.6 HRS

$T_{LAG} = 7.6$ HRS (NOT USED)

UNIT HYD. DURATION INTERVAL $= T_L / 5.5 = 1.36$ HRS $= t_r$

USE $t_r = 1$ HR.

* NOTES:

1. SNYDER COEFFICIENTS WERE NOT USED TO DEVELOP A UNIT HYDROGRAPH. THE DATA AVAILABLE FROM THE USGS & THE SCS PERTAINING TO FLOWS AT THE TRENTON DOWNSTREAM GAGE (D.A. 89 SQ.MI.) REVEALS THE 1975 FLOOD PEAK = 5540 cfs.
2. USGS FREQUENCY CURVES SHOW

25 YR FREQ.	2650 cfs
50 YR FREQ.	3290 cfs
100 YR FREQ.	4330 cfs
500 YR FREQ.	5665 cfs

3. WHITEHEAD POND DAM IS A RUN OF THE RIVER DAM WITH LITTLE PROBABLE ATTENUATION. THEREFORE FLOOD ROUTING IS UNNECESSARY. CALCULATE PEAK FLOW USING REPORT 38

BY J.C. DATE 1/14/80 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. 2 OF .....

CHKD. BY ..... DATE ..... WHITEHEAD POND DAM PROJECT C-246

SUBJECT ..... PEAK DISCHARGE .....

SIZE CLASSIFICATION : SMALL

HAZARD CLASSIFICATION : Significant Hg

∴ PRECIPITATION CRITERIA : 1 IN 100 YEAR FREQ. EVENT

USING SPECIAL REPORT 38 - "Magnitudes & Frequency of floods in New Jersey WITH EFFECTS OF URBANIZATION" - DEP & U.S.G.S. - STANKOWSKI 1971 CHARACTERISTICS USED IN REPORT FOR ASSUMPINK AT TRENTON N.J. GAGE STA. WHERE AREA IS 89.4 SQ.MI. & Q=60000 cfs

STORAGE	ST	%	3.6 %
SLOPE	S	FT/MI.	4.41
% IMPERVIOUS	I	%	11 %

UPDATE CHARACTERISTICS TO 1980
& FIND Q_{100} FOR 76.6 SQ.MI.

STORAGE HAS BEEN INCREASED WITH NEW UPSTREAM DAMS TO APPROXIMATELY 2.0 % MORE DUE TO NEW FLOOD CONTROL DAMS

∴ ST ≅ 5.5 %

SLOPE = 4.4 FT/MILE (SAME AS 1971)

% IMPERVIOUS SLIGHTLY HIGHER IN 1980 ≅ 13 %

Q_{100} = 4600 cfs FROM REPORT #38

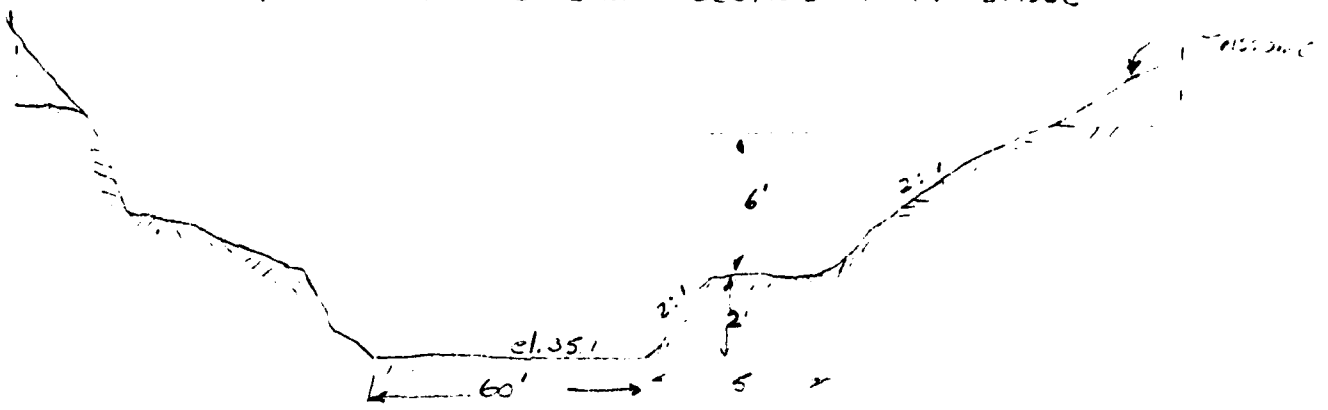
[illegible] APPLICABLE

BY J.C. DATE 1/15/80 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO 3 OF

CHKD. BY DATE WHITEHALL POND DAM PROJECT C-24½

SUBJECT CHANNEL CAPACITY

TYPICAL DOWNSTREAM SECTION FROM BRIDGE



n = .035

$Q = A \times \frac{1.486}{n} R^{2/3} S^{1/2}$

S = .00076 (FROM USGS GAGE DATA INFO.)

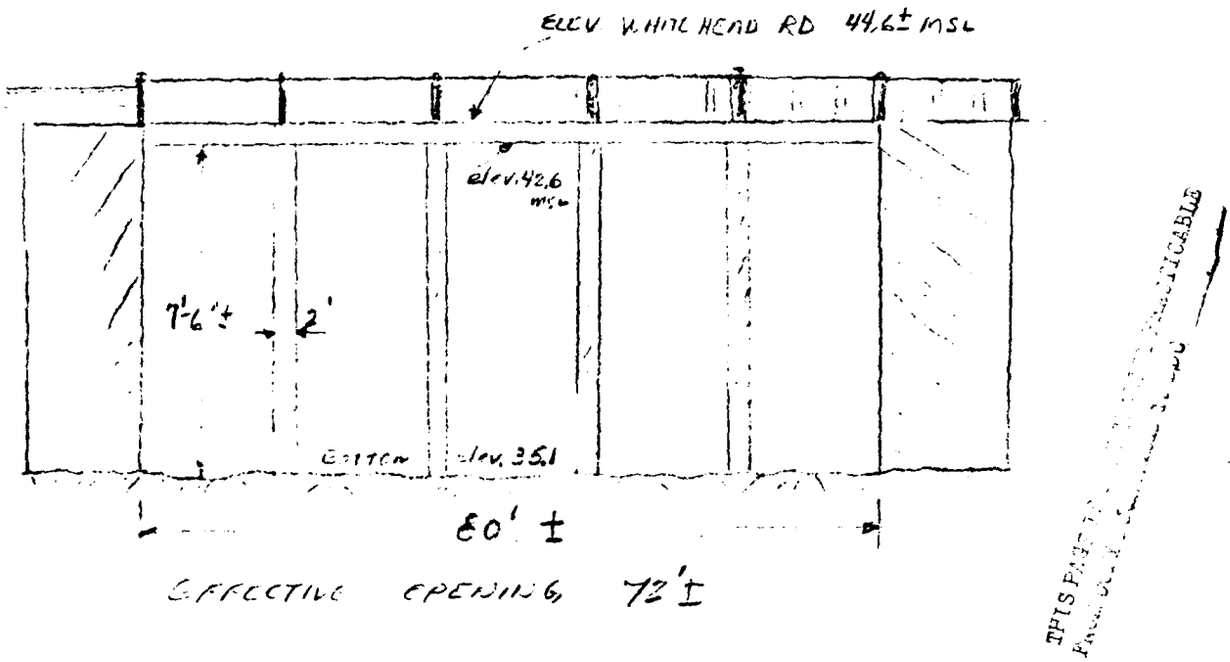
FIND HYDRAULIC CAP. OF FLOW IN ASSUNPINK ASSUMING THERE WERE NO BRIDGE CONSTRICTION

ELEV.	DEPTH	A	WP	R	$R^{2/3}$	S	$S^{1/2}$	Q
35.1	0							
36.1	1	62	64.4	.96	.97	.00076	.027	69
37.1	2	179	66.8	1.86	1.51			222
38.1	3	25-80 208	83.2	2.5	1.84			439
39.1	4	292	87.6	3.33	2.23			746
40.1	5	380	92	4.13	2.57			1120
41.1	6	472	96.8	4.87	2.88			1558
42.1	7	568	101.2	5.61	3.16			2057
42.6	7.5	617	103.4	5.97	3.29			2324
43.1	8	668	105.6	6.32	3.42			2619
44.1	9	772	110	7.02	3.66			3239
45.1	10	880	114.4	7.69	3.90			3934
46.1	11	992	118.8	8.35	4.11			4674
47.1	12	1109	123.2	8.99	4.32			5497
48.1	13	1228	127.6	9.62	4.52			6363
49.1	14	1352	132	10.24	4.72			7315

BY J.C. DATE 1/15/80 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. 4 OF

CHKD. BY DATE WHITEHALL POND DAM PROJECT C 246

SUBJECT SPILLWAY DISCHARGE CAPACITY - DOWNSTREAM BRIDGE - WHITEHEAD RD



ASSUME SUBCRITICAL FLOW THROUGH BRIDGE

FIND LEVEL OF WATER SURF ELEV. DUE TO BRIDGE CONSTRICTION BY CALCULATING LOSSES.

BRIDGE LOSSES $= K_c V^2/2g$

USE $K_c = 1.5$ TO ACCOUNT FOR ALL LOSSES

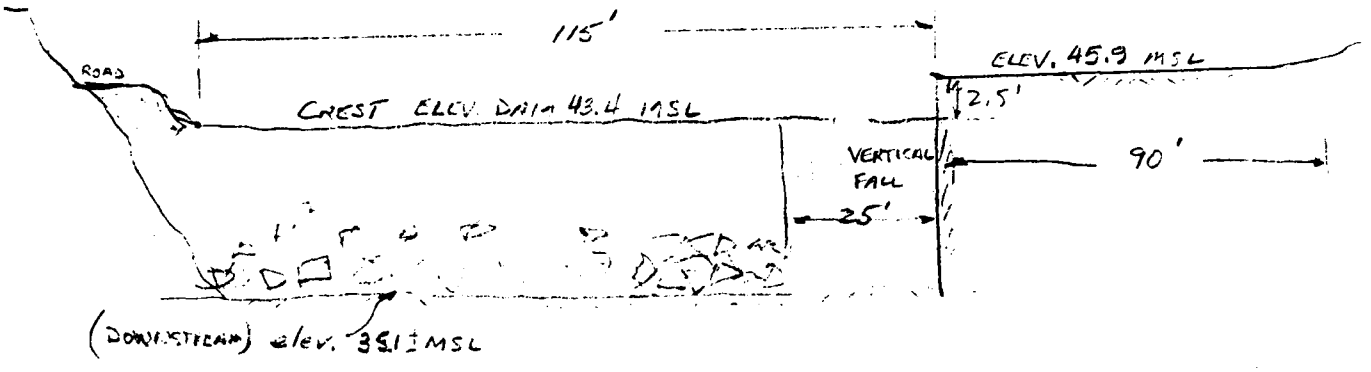
STREAM ELEV W/O CONSTRICT.	STREAM Q	DEPTH	AREA BRIDGE WATERWAY	VEL	$V^2/2g$	$K_c V^2/2g$	BRIDGE W.S. ELEV. DUE TO CONSTRICTION
36.1	69	1	72	.95	.01	.01	36.1
37.1	272	2	144	1.54	.04	.06	37.2
38.1	439	3	216	2.03	.06	.10	38.2
39.1	746	4	288	2.59	.10	.16	39.3
40.1	1120	5	360	3.11	.15	.23	40.3
41.1	1588	6	432	3.52	.19	.30	41.4
42.1	2057	7	504	4.08	.26	.39	42.5
42.6	2329	7.5	540	4.31	.29	.43	43.0	
43.1	2619	8	576	4.85	.36	.54	43.6
44.1	3231	9	"	6.0	.56	.84	44.9
45.1	3934	10	"	7.3	.82	1.24	46.3
46.1	4691	11	"	8.7	1.16	1.75	47.8
47.1	5454	12	"	10.16	1.6	2.40	49.5
48.1	6362	13	"	11.78	2.15	3.23	52.3
48.1	7311	"	"	13.54	2.84	4.27	53.4

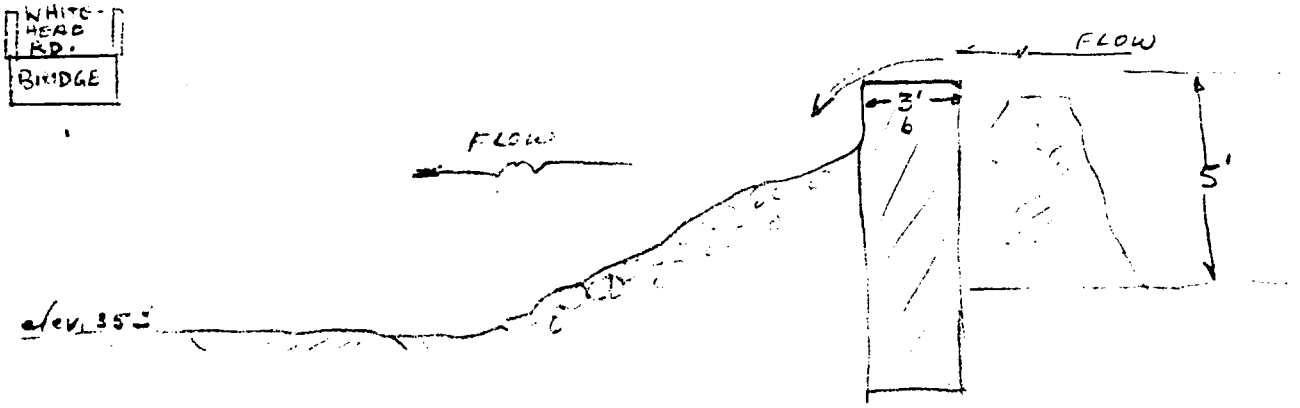
GOVERNS

BY J.C DATE 1/14/80 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. 5 OF

CHKD. BY DATE WHITEHEAD POND DAM PROJECT C 246

SUBJECT SPILLWAY DISCHARGE CAPACITY





FLOW OVER DAM ASSUMING NO TAILWATER

$Q = C L H^{3/2}$ VALUES OF C FROM KING'S HANDBOOK OF HYDRAULICS 5TH ED TABLE 5-3

ELEV.	DEPTH H	C	L	Q
43.4				0
44.0	.6	2.7	115	140
44.4	1.0	2.7		310
45.4	2.0	2.7		876
46.4	3.0	2.9		1733
47.4	4.0	3.1		2852
48.4	5.0	3.2		4242
49.4	6.0	3.3		5877
50.4	7.0	3.3		

GOVERNS

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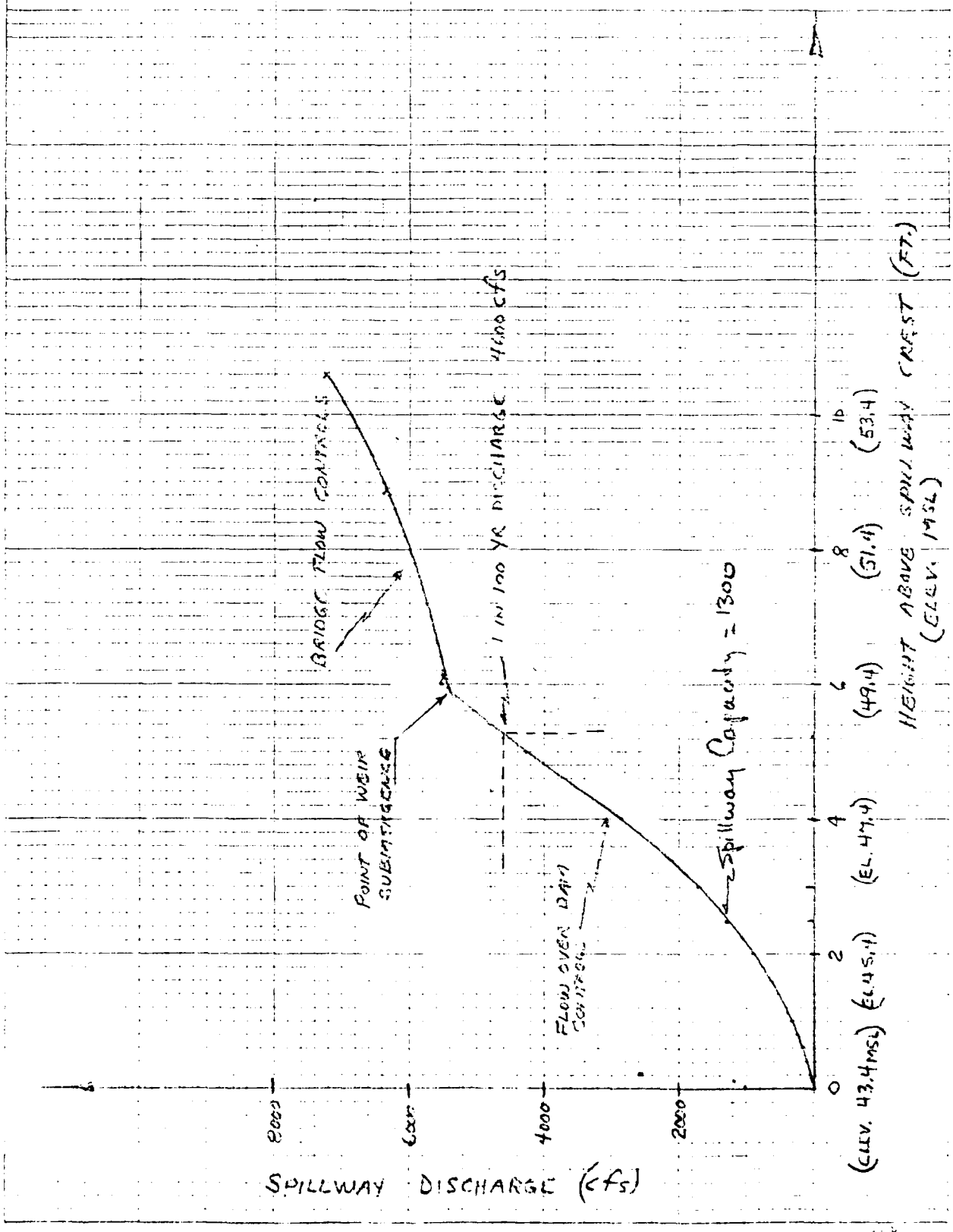
J.C. 1/15/80

SHEET NO. 6

PROJECT NO. C246

WHITEHEAD POND DAM
STAGE DISCHARGE CURVE



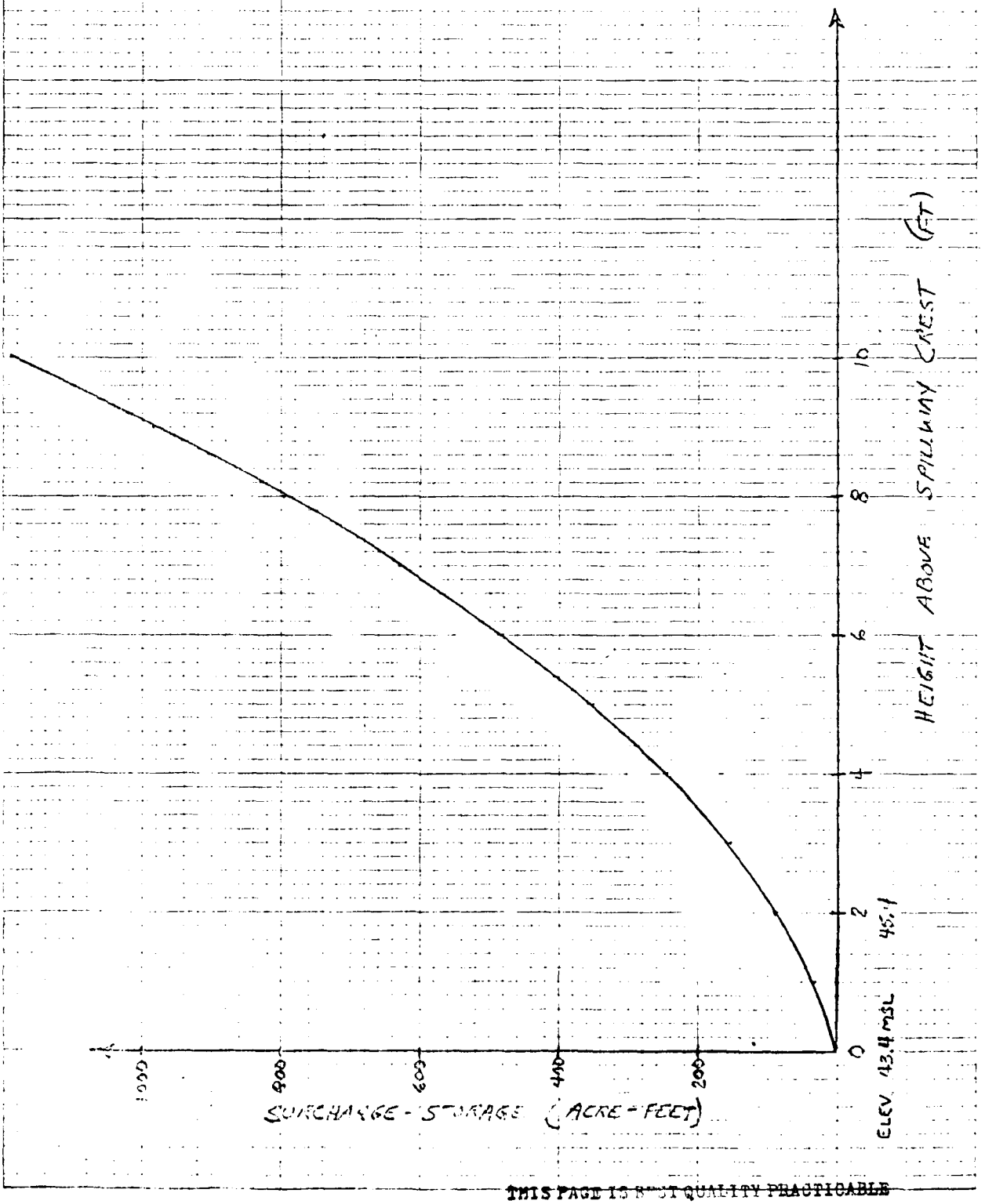
1/16/80 J.C.

SHEET NO 7

PROJECT NO: C246

WHITEHEAD POND DAM

STORAGE - DEPTH CURVE



BY J.C. DATE 1/15/80 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. 8 OF

CHKD. BY DATE WHITEHALL POND DAM PROJECT C-246

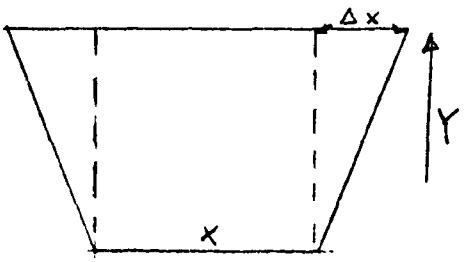
SUBJECT SURCHARGE STORAGE

AREA LAKE @ NORMAL POOL ELEV. 43.4 — 22 ACRES

AREA LAKE @ 50 CONTOUR — 150 ACRES

$\Delta X = \frac{150-22}{50-43.4} = 19.4$ AC/FT $\quad \Delta X = 9.7$ AC/FT. $\times 2.5 = 24$

by 50



INCREMENT VOLUME = $(X + \Delta X)\, Y$

ELEV.	(DEPTH) HEIGHT ABOVE SPILLWAY CREST	STORAGE
43.4	0	
44.4	1	32
45.4	2	83
46.4	3	153
47.4	4	243
48.4	5	353
49.4	6	481
50.4	7	630
51.4	8	797
52.4	9	984
53.4	10	1190

BY J.C. DATE 1/15/80 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. 9 OF

CHKD. BY DATE WHITEHEAD POND DAM PROJECT C246

SUBJECT STORAGE DISCHARGE SUMMARY & DRAWDOWN

SUMMARY OF STORAGE & DISCHARGE DATA

ELEV	DEPTH	DISCHARGE	STORAGE
43.4	0	0	0
44.4	1	400	32
45.4	2	900	83
46.4	3	1700	153
47.4	4	2800	243
48.4	5	4250	353
49.4	6	5400	481
50.4	7	5700	630
51.4	8	6000	797
52.4	9	6400	984
53.4	10	6900	1190

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STORAGE BELOW DAM SPILLWAY CREST

22 AC x 4' (AVG DEPTH ASSUMED) = 88 AC.FT

DRAWDOWN:

There is no drawdown facility on the dam.

Goodall

February 20, 1979

Mr. John H. O'Dowd, Acting Bureau Chief
Bureau of Flood Plain Management
Division of Water Resources
Department of Environmental Protection
State of New Jersey
P. O. Box 2809
Trenton, New Jersey 08625

Dear Mr. O'Dowd:

Thank you for your letters dated February 3rd and 6th which we received February 7th, relating to the leak and consequent repair of the Whitehead Pond Dam. We take exception to statements in your letter as we did to statements in discussions with you on Saturday a.m., February 3rd, prior to repair of the Dam.

Your letter was given wide distribution from your office, so for the edification of those receiving copies who are not acquainted with the facts leading up to the Dam leak, the discussions with your organization, and repair of the Dam by Goodall, a review in detail follows:

Sunday, January 21st, severe flooding was experienced in the Goodall area of Assunpink Creek. The Creek crested to 11'0, overflowing the Whitehead Road bridge, making it impassable, and bringing three feet of water into areas of our plant. Whereas we suffered substantial losses; without Goodall's flood pumping station and our flood prevention measures, the water would have been higher and the losses greater.

Wednesday, January 24th, we experienced another flood with creek waters cresting to 9'2", bringing 6" of water into parts of our plant.

We experienced two similar floods in 1978. In all , we have experienced ten to twelve floods of varying intensities, some very serious, since 1970; resulting in losses well over a million dollars. Faced with continual flooding problems; to stay in business in the Trenton area, we (Goodall) have spent in the neighborhood of $500,000 on flood control measures. Although, government agencies at various levels of government have been responsible in many ways for changing the direction of flood waters and the flood plain in our area, for example, the Route #1 Expressway with its high ground and retaining wall directly across the Assunpink from our plant which has directed flood waters onto Goodall property, we have never received one dollar of government aid in times of flood or for flood prevention. So in

effect, government, which has contributed to our flooding problems and resultant Dam erosion, now insists we effect a permanent repair of the Dam and pick up the cost in addition to what we have spent for flood prevention. Such poor government prior planning and disregard for industry problems have been a major consideration in four large industries quitting the Assunpink Creek/Trenton area these past eight years.

With that background we go to the Whitehead Pond Dam leak which was first noticed by Goodall personnel on Monday, January 29th. The leak was of minor significance. Following daily inspection it was decided three day later, February 1st, that a repair should be effected in view of recent past floods and the possibility of more which would further erode the Dam.

An inspection of the Dam showed a lateral crack in the concrete wall face near the Sweetbriar Road side. It was determined the crack was 24" to 36" below the top level of the Dam and narrowed down to a 12" or 18" diameter hole on the downstream slope of the Dam (see sketch). Water depth from top of the Dam to the Pond bed was approximately four to five feet.

In view of recent floods, and impending thaw with rains and more flooding, plus existing freezing weather conditions it was decided the only practical repair would be to seal the crack in the concrete wall face of the Dam, pond side. The seal would be made with rock and loose gravel fill over-lapping the lateral extremities of the crack up to the top of the Dam and back four to five feet from Dam wall into the Pond.

Considering the complete structure we did not feel there was any prospect of the Dam suddenly breaking up, as the crack was of minor significance; however, we did want to arrest any further erosion of the Dam. The structure of the Dam, which has held up under torrential flooding the past fifty years or more, is such that if breaks are not sealed, it will erode away over a long period of time in small pieces, but it will never be completely washed away in one fell swoop.

Thursday, February 1st, we were contacted by representatives of the New Jersey Environmental Protection Agency; you, Mr. O'Dowd, and Mr. Hofman, questioning the leak in the Dam. When told we were going to effect a repair which we felt was necessary to prevent further erosion, we were told that a "restraining order" would be issued to stop the repair. This statement by yourself and Mr. Hofman we could not comprehend. If there was concern over the Dam suddenly breaking up and endangering life and property then the conclusion would be to effect an immediate repair and prevent such a possibility; this repair is exactly what we had planned. You offered no alternative over the telephone Friday, February 2nd; so since we at Goodall who are thoroughly familiar with the Dam, the area around it, and floods, were pleased when you agreed to visit the site on Saturday morning, February 3rd, to become better acquainted with the Dam, the area, and our problems.

We did not see the possibility of the Dam suddenly collasping at this time or any time especially with the water level at dam height and coursing only over top center. Our greatest concern regarding loss of life and property has been from severe flooding over the past nine years with the same concern for the future. In this respect we have not heard from your Agency.

On the site, Saturday morning, February 3rd, you and Mr. Hofman were still talking "restraining order"; despite the urgency to make a repair. Finally we adjourned to the Goodall conference room where I described to you our "repair plan" which was to remove built-up rock piles (washed down by flooding) from the creek bed between the bridge and the area away from the toe (down slope) of the Dam, and seal in the area of the crack, pond side. I diagramed on the blackboard the approximate shape of the Dam, nature of the crack (leak), Whitehead Pond, and Goodall's water supply points, plus other features. You were told that we could effectively seal the leak so further immediate erosion would be halted and in doing so have a good chance to effect a long lasting repair. Your answer was for a permanent repair. You were very vague as to what you meant by permanent repair.

A permanent repair would involve a substantial project, taking up much time and costing a considerable sum of money. You were told a permanent repair was out of the question at this time: weather conditions were below freezing, concrete could not be poured. We had experienced two floods one week prior with more in the offing which would wash over and halt any attempts to drive pilings to hold back pond waters; pumps would be useless. The entire idea of a permanent repair at this time was just impractical. In addition, you were told Goodall did not have the funds to effect such a repair. When asked if your Agency would supply the funds and take over the repair or assume responsibility for the Dam eroding and breaking further, Mr. Hofman answered "no" to all. It was agreed we would then go ahead with Goodall's repair plan.

We returned to the dam site where you requested we use 400 to 500 pound stone to effect the repair. You were told this size stone was again impractical as the crack was not that wide and water would still pass through the voids between the stones and through the opening in the Dam. Further, it was Saturday, and no 400 to 500 pound stone were available. We dispatched a truck to Trap Rock Quarries and found they were closed. The repair was started utilizing the largest stones in the creek bed along with loose gravel for fill to seal the Dam.

Work proceeded with dispatch. Rock was removed from the creek bed without hitting or underminding the toe slope of the Dam or the side abutments. The repair was completed by 3:00 p.m. the same day. The crack and hole were sealed and flow of waters halted.

We purposely piled fill over dam height on the pond side to allow for settling or wash-away. It was, in our estimation, a very effective repair and should be a lasting one. Further immediate erosion or breaking away of pieces of the Dam has been halted.

In your letter of February 6th we do not concur with some of your statements. You were not present to witness the repair work; however, you did have a member of your organization at the site who spent 90% of time inside of his automobile as it was very cold. Your statement which was evidently passed along by your representative, stating: "the excavation for fill stone was amde in very close proximity to the toe of the downstream side of the Dam," is erroneous; we gave the toe of the Dam a wide berth, as all my people on the site will testify. The stability of the Dam has not been jeopardized.

By now, after observing the effectiveness of our repair the use of 400 to 500 pound stone would have been a mistake; they would not have sealed a leak of such small proportion.

The pile of stone above dam height has been removed per your request. However, we felt it had no effect on the passing of water. In event of a 11' flood as experienced on January 21, 1978, this pile of stone would have been under three feet of water. In the case of our 1975 flood, six to eight feet of water.

Despite the numerous floods we have experienced, with substantial losses and no government aid, it is ironic that your office further compounds our problem and makes it all the more difficult to stay in business in this area. The Dam leak was of minor significance in regard to "environmental protection". As a representative of "The Office of Flood Plain Management", where have you been these past nine years when flood waters have been redirected, flood plains changed, sending flood waters down on Goodall Rubber Company, other industries and residents of this area. We are very much a part of the environment. Has it dawned on anyone in government, at any level, that we also need protection from elements in order to thrive and prosper for the communities' sake.

Goodall Rubber Company does not have the funds to undertake an overall repair of the Whitehead Pond Dam, and it is questionable as to the importance at this time. If your office or any other governmental office are thinking of removing the Dam then you had better consider what happens to industry - Goodall Rubber Company and the residents below the Dam as the flood plain moves in our direction. The high ground supporting the Route #1 Expressway and the retaining wall across Assunpink Creek from Goodall will direct flood waters more in our direction. Goodall's elevation at this point is five to six feet below the Whitehead Pond bed, thus shifting the flood plain more into our area and the residential area of Whitehead Manor.

Instead of taking an adversary position, I would suggest that your office along with other governmental agencies federal, state and local look at the overall flood problems in our area and determine how you can help local industry and residents to continue to subsist.

February 20, 1979

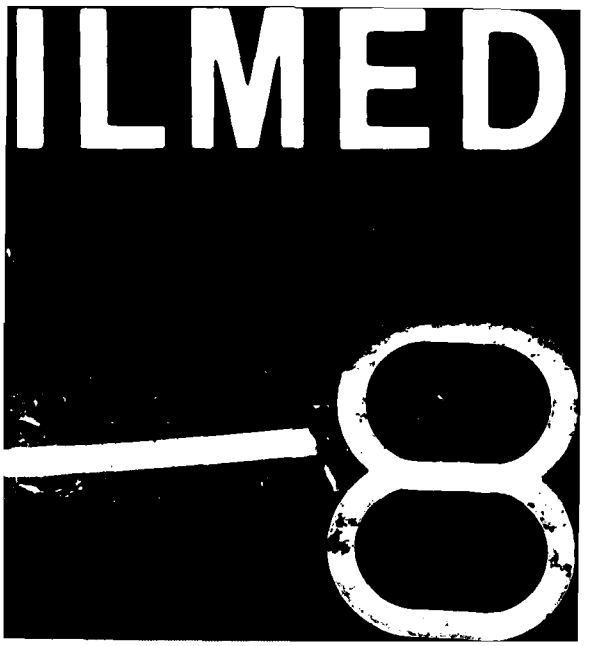
I will be glad to meet with you and discuss your demands on the Goodall Rubber Company as outlined in your letter. They are far reaching with more detrimental effects than you are aware of at this time.

Sincerely,

B. V. Edmunds
Assistant Vice President
Director of Engineering

BVE:aet
enclosure

cc: F. B. Williamson, III
Paul Arbesman
Jeff Zelikson
Dirk Hofman
Lawrence Township Clerk & Engineer
Hamilton Township Clerk & Engineer
County Engineer
Bill Zink, Corps of Engineers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